

<110> Meyers, Rachel A.

<130> 10448-095001

<150> 60/235,033

<151> 2000-09-25

<160> 13

<170> FastSEQ for Windows Version 4.0

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<211> 5437

<212> DNA

<213> Homo sapiens

 $\langle 220 \rangle$ 

<221> CDS

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ggataccttc agccagctca ttctggatga atgaatgatt acactaagtg tcctccacat 120

tcctctgtgg gctcacttca tggactcact ttgcgtgctt gttaaagtgtg ctgcgttgct 180

ccaagacca tgtaaagcct actgaccact aacctccctc acagcagaaa ctagacgtca 240

ggttaaa atg ggc aac tcc gac agt cag tac acc ctt caa gga tct aaa 289

Met Gly Asn Ser Asp Ser Gln Tyr Thr Leu Gln Gly Ser Lys

1 5 10

aat cat agc aat act att act ggt gct aag caa att cct tgc tcc ctg 337

Asn His Ser Asn Thr Ile Thr Gly Ala Lys Gln Ile Pro Cys Ser Leu

15                      20                      25                      30

aaa ata cgt ggc gtt cat gca aaa gag gaa aag tca ttg cat gga tgg 385

Lys Ile Arg Gly Val His Ala Lys Glu Glu Lys Ser Leu His Gly Trp

35                      40                      45

ggt cac ggg agc aac gga gca ggt tac aag tcc agg tcc ctg gcc cga 433

Gly His Gly Ser Asn Gly Ala Gly Tyr Lys Ser Arg Ser Leu Ala Arg

50                      55                      60

agc tgc ctt tct cac ttt aag agt aac cag cct tac gca tcg aga ctc 481

Ser Cys Leu Ser His Phe Lys Ser Asn Gln Pro Tyr Ala Ser Arg Leu

65                      70                      75

ggt ggc ccc aca tgc aag gtc tcc aga ggt gtt gcc tac tcc acg cac 529

Gly Gly Pro Thr Cys Lys Val Ser Arg Gly Val Ala Tyr Ser Thr His

80 85 90

agg aca aat gcc cca ggg aag gat ttc caq qgc atc agt qct qct ttc 577

|                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |      |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| Arg<br>95         | Thr               | Asn               | Ala               | Pro               | Gly<br>100        | Lys               | Asp               | Phe               | Gln               | Gly<br>105        | Ile               | Ser               | Ala               | Ala               | Phe<br>110        |      |
| tca<br>Ser        | act<br>Thr        | gag<br>Glu        | aat<br>Asn        | ggc<br>Gly<br>115 | ttc<br>Phe        | cat<br>His        | tct<br>Ser        | gtt<br>Val        | ggc<br>Gly<br>120 | cac<br>His        | gag<br>Glu        | ctg<br>Leu        | gca<br>Ala        | gat<br>Asp<br>125 | aac<br>Asn        | 625  |
| cac<br>His        | atc<br>Ile        | acc<br>Thr        | tcc<br>Ser<br>130 | aga<br>Arg        | gac<br>Asp        | tgc<br>Cys        | aac<br>Asn        | gga<br>Gly<br>135 | cac<br>His        | ctt<br>Leu        | ctc<br>Leu        | aac<br>Asn        | tgc<br>Cys<br>140 | tac<br>Tyr        | ggg<br>Gly        | 673  |
| agg<br>Arg        | aat<br>Asn        | gag<br>Glu<br>145 | agc<br>Ser        | att<br>Ile        | gcc<br>Ala        | tcc<br>Ser        | acc<br>Thr<br>150 | cca<br>Pro        | ccg<br>Pro        | ggc<br>Gly        | gaa<br>Glu        | gac<br>Asp<br>155 | cgc<br>Arg        | aag<br>Lys        | agc<br>Ser        | 721  |
| ccc<br>Pro        | cga<br>Arg<br>160 | gtg<br>Val        | ctc<br>Leu        | atc<br>Ile        | aaa<br>Lys        | acg<br>Thr<br>165 | ctg<br>Leu        | ggg<br>Gly        | aag<br>Lys        | ccg<br>Pro        | gat<br>Asp<br>170 | ggg<br>Gly        | tgt<br>Cys        | tta<br>Leu        | agg<br>Arg        | 769  |
| gtc<br>Val<br>175 | gag<br>Glu        | ttc<br>Phe        | cac<br>His        | aat<br>Asn        | ggg<br>Gly<br>180 | ggc<br>Gly        | aac<br>Asn        | ccc<br>Pro        | agc<br>Ser        | aaa<br>Lys<br>185 | gtg<br>Val        | cct<br>Pro        | gca<br>Ala        | gag<br>Glu        | gac<br>Asp<br>190 | 817  |
| tgc<br>Cys        | agt<br>Ser        | gag<br>Glu        | ccg<br>Pro        | gtg<br>Val<br>195 | cag<br>Gln        | ctg<br>Leu        | ctg<br>Leu        | agg<br>Arg<br>200 | tac<br>Tyr        | tca<br>Ser        | cct<br>Pro        | acc<br>Thr        | tta<br>Leu<br>205 | gca<br>Ala        | tcg<br>Ser        | 865  |
| gaa<br>Glu        | acc<br>Thr        | tcc<br>Ser<br>210 | cct<br>Pro        | gtg<br>Val        | cct<br>Pro        | gaa<br>Glu        | gcc<br>Ala<br>215 | agg<br>Arg<br>215 | agg<br>Arg        | ggg<br>Gly        | tcc<br>Ser        | agc<br>Ser        | gcc<br>Ala<br>220 | gat<br>Asp        | tcc<br>Ser        | 913  |
| ctg<br>Leu        | ccc<br>Pro<br>225 | agc<br>Ser        | cat<br>His        | cgc<br>Arg        | ccc<br>Pro        | tct<br>Ser        | ccc<br>Pro<br>230 | acg<br>Thr        | gac<br>Asp        | tct<br>Ser        | cgc<br>Arg        | ctg<br>Leu<br>235 | cgg<br>Arg        | tcc<br>Ser        | agc<br>Ser        | 961  |
| aaa<br>Lys<br>240 | ggc<br>Gly        | agc<br>Ser        | tcc<br>Ser        | ctg<br>Leu        | agt<br>Ser<br>245 | tct<br>Ser        | gag<br>Glu<br>245 | tca<br>Ser        | tcc<br>Ser        | tgg<br>Trp<br>250 | tac<br>Tyr        | gac<br>Asp        | tcc<br>Ser        | cct<br>Pro        | tgg<br>Trp        | 1009 |
| ggc<br>Gly<br>255 | aat<br>Asn        | gct<br>Ala        | gga<br>Gly        | gag<br>Glu<br>260 | ctg<br>Leu        | agc<br>Ser        | gag<br>Glu        | gct<br>Ala        | gag<br>Glu<br>265 | ggc<br>Gly<br>265 | tcc<br>Ser        | ttc<br>Phe        | ctg<br>Leu        | gcc<br>Ala<br>270 | ccc<br>Pro<br>270 | 1057 |
| ggc<br>Gly        | atg<br>Met        | cct<br>Pro        | gac<br>Asp<br>275 | ccc<br>Pro        | agt<br>Ser        | ctc<br>Leu        | cat<br>His        | gcc<br>Ala<br>280 | agc<br>Ser<br>280 | ttc<br>Phe        | cca<br>Pro        | cct<br>Pro        | ggc<br>Gly<br>285 | gat<br>Asp<br>285 | gcc<br>Ala        | 1105 |
| aaa<br>Lys        | aag<br>Lys        | cct<br>Pro<br>290 | ttc<br>Phe        | aac<br>Asn        | caa<br>Gln        | agc<br>Ser        | tct<br>Ser<br>295 | tcc<br>Ser<br>295 | ctc<br>Leu        | tcc<br>Ser        | tcc<br>Ser        | ctc<br>Leu        | cgg<br>Arg<br>300 | gaa<br>Glu        | ctg<br>Leu        | 1153 |
| tac<br>Tyr        | aaa<br>Lys<br>305 | gat<br>Asp        | gcc<br>Ala        | aac<br>Asn        | ctg<br>Leu        | ggg<br>Gly<br>310 | agc<br>Ser<br>310 | ctc<br>Leu        | tcc<br>Ser<br>310 | ccc<br>Pro        | tca<br>Ser<br>315 | ggg<br>Gly<br>315 | atc<br>Ile        | cgc<br>Arg        | ctt<br>Leu        | 1201 |
| tct<br>Ser        | gat<br>Asp        | gaa<br>Glu        | tac<br>Tyr        | atg<br>Met        | ggc<br>Gly        | acg<br>Thr        | cat<br>His        | gcc<br>Ala        | agc<br>Ser        | ctg<br>Leu        | agc<br>Ser        | aac<br>Asn        | cgt<br>Arg        | gtc<br>Val        | tct<br>Ser        | 1249 |

|                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |      |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| 320               |                   |                   |                   | 325               |                   |                   |                   | 330               |                   |                   |                   |                   |                   |                   |                   |      |
| ttt<br>Phe<br>335 | gct<br>Ala        | tcc<br>Ser        | gac<br>Asp        | att<br>Ile        | gat<br>Asp<br>340 | gtg<br>Val        | ccc<br>Pro        | tcc<br>Ser        | aga<br>Arg        | gtg<br>Val<br>345 | gca<br>Ala        | cac<br>His        | ggg<br>Gly        | gac<br>Asp        | ccc<br>Pro<br>350 | 1297 |
| atc<br>Ile        | cag<br>Gln        | tac<br>Tyr        | agt<br>Ser<br>355 | tcc<br>Ser<br>355 | ttc<br>Phe        | act<br>Thr        | ctc<br>Leu        | ccc<br>Pro<br>360 | tgt<br>Cys        | cgg<br>Arg        | aag<br>Lys        | ccc<br>Pro        | aaa<br>Lys<br>365 | gcc<br>Ala        | ttt<br>Phe        | 1345 |
| gtt<br>Val        | gag<br>Glu        | gat<br>Asp        | act<br>Thr<br>370 | gcg<br>Ala        | aag<br>Lys        | aag<br>Lys        | gac<br>Asp<br>375 | tcc<br>Ser<br>375 | ctc<br>Leu        | aaa<br>Lys        | gcc<br>Ala        | agg<br>Arg<br>380 | atg<br>Met        | cga<br>Arg        | cgg<br>Arg        | 1393 |
| atc<br>Ile        | agt<br>Ser        | gac<br>Asp<br>385 | tgg<br>Trp        | acg<br>Thr        | gga<br>Gly        | agc<br>Ser        | ctc<br>Leu<br>390 | tca<br>Ser        | agg<br>Arg        | aag<br>Lys        | aaa<br>Lys<br>395 | agg<br>Arg<br>395 | aaa<br>Lys        | ctc<br>Leu        | cag<br>Gln        | 1441 |
| gag<br>Glu<br>400 | ccg<br>Pro        | agg<br>Arg        | tcc<br>Ser        | aag<br>Lys        | gag<br>Glu<br>405 | ggc<br>Gly        | agt<br>Ser        | gac<br>Asp        | tac<br>Tyr        | ttt<br>Phe<br>410 | gac<br>Asp<br>410 | agt<br>Ser        | cgc<br>Arg        | tct<br>Ser        | gat<br>Asp        | 1489 |
| gga<br>Gly<br>415 | ctg<br>Leu        | aat<br>Asn        | aca<br>Thr        | gat<br>Asp<br>420 | gtg<br>Val<br>420 | cag<br>Gln        | gga<br>Gly        | tcc<br>Ser        | tcc<br>Ser        | cag<br>Gln<br>425 | gca<br>Ala        | tct<br>Ser        | gct<br>Ala        | ttt<br>Phe        | ctg<br>Leu<br>430 | 1537 |
| tgg<br>Trp        | tca<br>Ser        | ggg<br>Gly        | ggc<br>Gly<br>435 | tct<br>Ser<br>435 | act<br>Thr        | cag<br>Gln        | atc<br>Ile        | ctg<br>Leu<br>440 | tct<br>Ser<br>440 | cag<br>Gln        | aga<br>Arg        | agt<br>Ser        | gaa<br>Glu        | tcc<br>Ser<br>445 | aca<br>Thr        | 1585 |
| cat<br>His        | gcg<br>Ala        | att<br>Ile<br>450 | ggc<br>Gly<br>450 | agc<br>Ser        | gat<br>Asp        | ccc<br>Pro        | ctc<br>Leu<br>455 | cgg<br>Arg<br>455 | cag<br>Gln        | aac<br>Asn        | att<br>Ile        | tat<br>Tyr<br>460 | gag<br>Glu<br>460 | aat<br>Asn        | ttc<br>Phe        | 1633 |
| atg<br>Met        | cga<br>Arg        | gag<br>Glu<br>465 | ttg<br>Leu        | gaa<br>Glu        | atg<br>Met        | agc<br>Ser        | agg<br>Arg<br>470 | acc<br>Thr        | aac<br>Asn        | act<br>Thr        | gag<br>Glu<br>475 | aac<br>Asn        | ata<br>Ile        | gaa<br>Glu        | aca<br>Thr        | 1681 |
| tct<br>Ser<br>480 | aca<br>Thr<br>480 | gaa<br>Glu        | acc<br>Thr        | gcc<br>Ala        | gag<br>Glu<br>485 | tcc<br>Ser<br>485 | agc<br>Ser        | agc<br>Ser        | gag<br>Glu        | tca<br>Ser<br>490 | ctc<br>Leu<br>490 | agc<br>Ser        | tct<br>Ser        | ctg<br>Leu        | gaa<br>Glu        | 1729 |
| cag<br>Gln<br>495 | ctg<br>Leu        | gat<br>Asp        | ctg<br>Leu        | ctc<br>Leu        | ttc<br>Phe<br>500 | gag<br>Glu        | aag<br>Lys        | gaa<br>Glu        | cag<br>Gln        | ggg<br>Gly<br>505 | gtg<br>Val        | gtc<br>Val        | cgg<br>Arg        | agg<br>Arg        | gcc<br>Ala<br>510 | 1777 |
| ggg<br>Gly        | tgg<br>Trp        | ctc<br>Leu        | ttc<br>Phe<br>515 | ttc<br>Phe<br>515 | aag<br>Lys        | ccc<br>Pro        | ctg<br>Leu        | gtc<br>Val<br>520 | act<br>Thr<br>520 | gtg<br>Val        | cag<br>Gln        | aag<br>Lys        | gaa<br>Glu<br>525 | agg<br>Arg        | aag<br>Lys        | 1825 |
| ctt<br>Leu        | gag<br>Glu        | ctg<br>Leu        | gtg<br>Val<br>530 | gca<br>Ala        | cga<br>Arg        | agg<br>Arg        | aaa<br>Lys        | tgg<br>Trp<br>535 | aaa<br>Lys        | cag<br>Gln        | tac<br>Tyr        | tgg<br>Trp<br>540 | gta<br>Val        | acg<br>Thr        | ctg<br>Leu        | 1873 |
| aaa<br>Lys        | gga<br>Gly        | tgc<br>Cys<br>545 | acg<br>Thr        | ctg<br>Leu        | ctg<br>Leu        | ttt<br>Phe<br>550 | tat<br>Tyr<br>550 | gag<br>Glu        | acc<br>Thr        | tat<br>Tyr        | ggg<br>Gly<br>555 | aag<br>Lys<br>555 | aat<br>Asn        | tcc<br>Ser        | atg<br>Met        | 1921 |

1969  
2017  
2065  
2113  
2161  
2209  
2257  
2305  
2353  
2401  
2449  
2497  
2545  
2593

|                                                                 |      |
|-----------------------------------------------------------------|------|
| cct tct ata act cag gtc gat gaa ctt ctg cat ata tat ggt tca aca | 2641 |
| Pro Ser Ile Thr Gln Val Asp Glu Leu Leu His Ile Tyr Gly Ser Thr |      |
| 785 790 795                                                     |      |
| gtg gac ggt gtt ccc cga gac aat gca tgg gaa atc cag act tat gtt | 2689 |
| Val Asp Gly Val Pro Arg Asp Asn Ala Trp Glu Ile Gln Thr Tyr Val |      |
| 800 805 810                                                     |      |
| cac ttt cag gac aat cac gga gtt act gta ggg atc aag cca gag cac | 2737 |
| His Phe Gln Asp Asn His Gly Val Thr Val Gly Ile Lys Pro Glu His |      |
| 815 820 825 830                                                 |      |
| aga gta gaa gat att ttg act ttg gca tgc aag atg agg cag ttg gaa | 2785 |
| Arg Val Glu Asp Ile Leu Thr Leu Ala Cys Lys Met Arg Gln Leu Glu |      |
| 835 840 845                                                     |      |
| ccc agc cat tat ggc cta cag ctt cga aaa tta gta gat gac aat gtt | 2833 |
| Pro Ser His Tyr Gly Leu Gln Leu Arg Lys Leu Val Asp Asp Asn Val |      |
| 850 855 860                                                     |      |
| gag tat tgc atc cct gca cca tat gaa tat atg caa caa cag gtt tat | 2881 |
| Glu Tyr Cys Ile Pro Ala Pro Tyr Glu Tyr Met Gln Gln Gln Val Tyr |      |
| 865 870 875                                                     |      |
| gat gaa ata gaa gtc ttt cca cta aat gtt tat gat gtg cag ctc acg | 2929 |
| Asp Glu Ile Glu Val Phe Pro Leu Asn Val Tyr Asp Val Gln Leu Thr |      |
| 880 885 890                                                     |      |
| aag act ggg agt gtg tgt gac ttt ggg ttt gca gtt aca gcg cag gtg | 2977 |
| Lys Thr Gly Ser Val Cys Asp Phe Gly Phe Ala Val Thr Ala Gln Val |      |
| 895 900 905 910                                                 |      |
| gat gag cgt cag cat ctc agc cgg ata ttt ata agc gac gtt ctt ccc | 3025 |
| Asp Glu Arg Gln His Leu Ser Arg Ile Phe Ile Ser Asp Val Leu Pro |      |
| 915 920 925                                                     |      |
| gat ggc ctg gcg tat ggg gaa ggg ctg aga aag ggc aat gag atc atg | 3073 |
| Asp Gly Leu Ala Tyr Gly Glu Gly Leu Arg Lys Gly Asn Glu Ile Met |      |
| 930 935 940                                                     |      |
| acc tta aat ggg gaa gct gtg tct gat ctt gac ctt aag cag atg gag | 3121 |
| Thr Leu Asn Gly Glu Ala Val Ser Asp Leu Asp Leu Lys Gln Met Glu |      |
| 945 950 955                                                     |      |
| gcc ctg ttt tct gag aag agc gtc gga ctc act ctg att gcc cgg cct | 3169 |
| Ala Leu Phe Ser Glu Lys Ser Val Gly Leu Thr Leu Ile Ala Arg Pro |      |
| 960 965 970                                                     |      |
| ccg gac aca aaa gca acc ctg tgt aca tcc tgg tca gac agt gac ctg | 3217 |
| Pro Asp Thr Lys Ala Thr Leu Cys Thr Ser Trp Ser Asp Ser Asp Leu |      |
| 975 980 985 990                                                 |      |
| ttc tcc agg gac cag aag agt ctg ctg ccc cct cct aac cag tcc caa | 3265 |
| Phe Ser Arg Asp Gln Lys Ser Leu Leu Pro Pro Pro Asn Gln Ser Gln |      |
| 995 1000 1005                                                   |      |
| ctg ctg gag gaa ttc ctg gat aac ttt aaa aag aat aca gcc aat gat | 3313 |

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|      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |     |      |
|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|
| Leu  | Leu | Glu | Glu | Phe  | Leu | Asp | Asn | Phe  | Lys | Lys | Asn | Thr  | Ala | Asn | Asp |      |
| 1010 |     |     |     |      |     |     |     | 1015 |     |     |     | 1020 |     |     |     |      |
| ttc  | agc | aac | gtc | cct  | gat | atc | aca | aca  | ggg | ctg | aaa | agg  | agt | cag | aca | 3361 |
| Phe  | Ser | Asn | Val | Pro  | Asp | Ile | Thr | Thr  | Gly | Leu | Lys | Arg  | Ser | Gln | Thr |      |
| 1025 |     |     |     |      |     |     |     | 1030 |     |     |     | 1035 |     |     |     |      |
| gat  | ggc | act | ctg | gat  | cag | gtt | tcc | cac  | agg | gag | aaa | atg  | gag | cag | aca | 3409 |
| Asp  | Gly | Thr | Leu | Asp  | Gln | Val | Ser | His  | Arg | Glu | Lys | Met  | Glu | Gln | Thr |      |
| 1040 |     |     |     |      |     |     |     | 1045 |     |     |     | 1050 |     |     |     |      |
| ttc  | agg | agt | gct | gag  | cag | atc | act | gca  | ctg | tgc | agg | agt  | ttt | aac | gac | 3457 |
| Phe  | Arg | Ser | Ala | Glu  | Gln | Ile | Thr | Ala  | Leu | Cys | Arg | Ser  | Phe | Asn | Asp |      |
| 1055 |     |     |     |      |     |     |     |      |     |     |     | 1070 |     |     |     |      |
| agt  | cag | gcc | aac | ggc  | atg | gaa | gga | ccg  | cgg | gag | aat | cag  | gat | cct | cct | 3505 |
| Ser  | Gln | Ala | Asn | Gly  | Met | Glu | Gly | Pro  | Arg | Glu | Asn | Gln  | Asp | Pro | Pro |      |
|      |     |     |     | 1075 |     |     |     | 1080 |     |     |     | 1085 |     |     |     |      |
| ccg  | agg | cct | ctg | gcc  | cgc | cac | ctg | tct  | gat | gca | gac | cgc  | ctc | cgc | aaa | 3553 |
| Pro  | Arg | Pro | Leu | Ala  | Arg | His | Leu | Ser  | Asp | Ala | Asp | Arg  | Leu | Arg | Lys |      |
|      |     |     |     | 1090 |     |     |     | 1095 |     |     |     | 1100 |     |     |     |      |
| gtc  | atc | cag | gag | ctt  | gtg | gac | aca | gag  | aag | tcc | tac | gtg  | aag | gat | ttg | 3601 |
| Val  | Ile | Gln | Glu | Leu  | Val | Asp | Thr | Glu  | Lys | Ser | Tyr | Val  | Lys | Asp | Leu |      |
|      |     |     |     | 1105 |     |     |     | 1110 |     |     |     | 1115 |     |     |     |      |
| agc  | tgc | ctc | ttt | gaa  | tta | tac | ttg | gag  | cca | ctt | cag | aat  | gag | acc | ttt | 3649 |
| Ser  | Cys | Leu | Phe | Glu  | Leu | Tyr | Leu | Glu  | Pro | Leu | Gln | Asn  | Glu | Thr | Phe |      |
|      |     |     |     | 1120 |     |     |     | 1125 |     |     |     | 1130 |     |     |     |      |
| ctt  | acc | caa | gat | gag  | atg | gag | tca | ctt  | ttt | gga | agt | ttg  | cca | gag | atg | 3697 |
| Leu  | Thr | Gln | Asp | Glu  | Met | Glu | Ser | Leu  | Phe | Gly | Ser | Leu  | Pro | Glu | Met |      |
| 1135 |     |     |     | 1140 |     |     |     | 1145 |     |     |     | 1150 |     |     |     |      |
| ctt  | gag | ttt | cag | aag  | gtg | ttt | ctg | gag  | acc | ctg | gag | gat  | ggg | att | tca | 3745 |
| Leu  | Glu | Phe | Gln | Lys  | Val | Phe | Leu | Glu  | Thr | Leu | Glu | Asp  | Gly | Ile | Ser |      |
|      |     |     |     | 1155 |     |     |     | 1160 |     |     |     | 1165 |     |     |     |      |
| gca  | tca | tct | gac | ttt  | aac | acc | cta | gaa  | acc | ccc | tca | cag  | ttt | aga | aaa | 3793 |
| Ala  | Ser | Ser | Asp | Phe  | Asn | Thr | Leu | Glu  | Thr | Pro | Ser | Gln  | Phe | Arg | Lys |      |
|      |     |     |     | 1170 |     |     |     | 1175 |     |     |     | 1180 |     |     |     |      |
| tta  | ctg | ttt | tcc | ctt  | gga | ggc | tct | ttc  | ctt | tat | tac | gcg  | gac | cac | ttt | 3841 |
| Leu  | Leu | Phe | Ser | Leu  | Gly | Gly | Ser | Phe  | Leu | Tyr | Tyr | Ala  | Asp | His | Phe |      |
|      |     |     |     | 1185 |     |     |     | 1190 |     |     |     | 1195 |     |     |     |      |
| aaa  | ctg | tac | agt | gga  | ttc | tgt | gct | aac  | cat | atc | aaa | gta  | cag | aag | gtt | 3889 |
| Lys  | Leu | Tyr | Ser | Gly  | Phe | Cys | Ala | Asn  | His | Ile | Lys | Val  | Gln | Lys | Val |      |
| 1200 |     |     |     | 1205 |     |     |     | 1210 |     |     |     |      |     |     |     |      |
| ctg  | gag | cga | gct | aaa  | act | gac | aaa | gcc  | ttc | aag | gct | ttt  | ctg | gat | gcc | 3937 |
| Leu  | Glu | Arg | Ala | Lys  | Thr | Asp | Lys | Ala  | Phe | Lys | Ala | Phe  | Leu | Asp | Ala |      |
| 1215 |     |     |     | 1220 |     |     |     | 1225 |     |     |     | 1230 |     |     |     |      |
| cgg  | aac | ccc | acc | aag  | cag | cat | tcc | tcc  | acg | ctg | gag | tcc  | tac | ctc | atc | 3985 |
| Arg  | Asn | Pro | Thr | Lys  | Gln | His | Ser | Ser  | Thr | Leu | Glu | Ser  | Tyr | Leu | Ile |      |

| 1235                                                            | 1240 | 1245 |      |
|-----------------------------------------------------------------|------|------|------|
| aag ccg gtt cag aga gtg ctc aag tac ccg ctg ctg ctc aag gag ctg |      |      | 4033 |
| Lys Pro Val Gln Arg Val Leu Lys Tyr Pro Leu Leu Leu Lys Glu Leu |      |      |      |
| 1250                                                            | 1255 | 1260 |      |
| gtg tcc ctg acg gac cag gag agc gag gag cac tac cac ctg acg gaa |      |      | 4081 |
| Val Ser Leu Thr Asp Gln Glu Ser Glu Glu His Tyr His Leu Thr Glu |      |      |      |
| 1265                                                            | 1270 | 1275 |      |
| gca cta aag gca atg gag aaa gta gcg agc cac atc aat gag atg cag |      |      | 4129 |
| Ala Leu Lys Ala Met Glu Lys Val Ala Ser His Ile Asn Glu Met Gln |      |      |      |
| 1280                                                            | 1285 | 1290 |      |
| aag atc tat gag gat tat ggg acc gtg ttt gac cag cta gta gct gag |      |      | 4177 |
| Lys Ile Tyr Glu Asp Tyr Gly Thr Val Phe Asp Gln Leu Val Ala Glu |      |      |      |
| 1295                                                            | 1300 | 1305 | 1310 |
| cag agc gga aca gag aag gag gta aca gaa ctt tcg atg gga gag ctt |      |      | 4225 |
| Gln Ser Gly Thr Glu Lys Glu Val Thr Glu Leu Ser Met Gly Glu Leu |      |      |      |
| 1315                                                            | 1320 | 1325 |      |
| ctg atg cac tct acg gtt tcc tgg ttg aat cca ttt ctg tct cta gga |      |      | 4273 |
| Leu Met His Ser Thr Val Ser Trp Leu Asn Pro Phe Leu Ser Leu Gly |      |      |      |
| 1330                                                            | 1335 | 1340 |      |
| aaa gct aga aag gac ctt gag ctc aca gta ttt gtt ttt aag aga gcc |      |      | 4321 |
| Lys Ala Arg Lys Asp Leu Glu Leu Thr Val Phe Val Phe Lys Arg Ala |      |      |      |
| 1345                                                            | 1350 | 1355 |      |
| gtc ata ctg gtt tat aaa gaa aac tgc aaa ctg aaa aag aaa ttg ccc |      |      | 4369 |
| Val Ile Leu Val Tyr Lys Glu Asn Cys Lys Leu Lys Lys Lys Leu Pro |      |      |      |
| 1360                                                            | 1365 | 1370 |      |
| tcg aat tcc cgg cct gca cac aac tct act gac ttg gac cca ttt aaa |      |      | 4417 |
| Ser Asn Ser Arg Pro Ala His Asn Ser Thr Asp Leu Asp Pro Phe Lys |      |      |      |
| 1375                                                            | 1380 | 1385 | 1390 |
| ttc cgc tgg ttg atc ccc atc tcc gcg ctt caa gtc aga ctg ggg aat |      |      | 4465 |
| Phe Arg Trp Leu Ile Pro Ile Ser Ala Leu Gln Val Arg Leu Gly Asn |      |      |      |
| 1395                                                            | 1400 | 1405 |      |
| cca gca ggg aca gaa aat aat tcc ata tgg gaa ctg atc cat acg aag |      |      | 4513 |
| Pro Ala Gly Thr Glu Asn Asn Ser Ile Trp Glu Leu Ile His Thr Lys |      |      |      |
| 1410                                                            | 1415 | 1420 |      |
| tca gaa ata gaa gga cgg cca gaa acc atc ttt cag ttg tgt tgc agt |      |      | 4561 |
| Ser Glu Ile Glu Gly Arg Pro Glu Thr Ile Phe Gln Leu Cys Cys Ser |      |      |      |
| 1425                                                            | 1430 | 1435 |      |
| gac agt gaa agc aaa acc aac att gtt aag gtg att cgt tct att ctg |      |      | 4609 |
| Asp Ser Glu Ser Lys Thr Asn Ile Val Lys Val Ile Arg Ser Ile Leu |      |      |      |
| 1440                                                            | 1445 | 1450 |      |
| agg gaa aac ttc agg cgt cac ata aag tgt gaa tta cca ctg gag aaa |      |      | 4657 |
| Arg Glu Asn Phe Arg Arg His Ile Lys Cys Glu Leu Pro Leu Glu Lys |      |      |      |
| 1455                                                            | 1460 | 1465 | 1470 |

1235 1240 1245 1250 1255 1260 1265 1270 1275 1280 1285 1290 1295 1300 1305 1310 1315 1320 1325 1330 1335 1340 1345 1350 1355 1360 1365 1370 1375 1380 1385 1390 1395 1400 1405 1410 1415 1420 1425 1430 1435 1440 1445 1450 1455 1460 1465 1470

acg tgt aag gat cgc ctg gta cct ctt aag aac cga gtt cct gtt tcg 4705  
 Thr Cys Lys Asp Arg Leu Val Pro Leu Lys Asn Arg Val Pro Val Ser  
 1475 1480 1485

gcc aaa tta gct tca tcc agg tct tta aaa gtc ctg aag aat tcc tcc 4753  
 Ala Lys Leu Ala Ser Ser Arg Ser Leu Lys Val Leu Lys Asn Ser Ser  
 1490 1495 1500

agc aac gag tgg acc ggt gag act ggc aag gga acc ttg ctg gac tct 4801  
 Ser Asn Glu Trp Thr Gly Glu Thr Gly Lys Gly Thr Leu Leu Asp Ser  
 1505 1510 1515

gac gag ggc agc ttg agc agc ggc acc cag agc agc ggc tgc ccc acg 4849  
 Asp Glu Gly Ser Leu Ser Ser Gly Thr Gln Ser Ser Gly Cys Pro Thr  
 1520 1525 1530

gct gag ggc agg cag gac tcc aag agc act tct ccc ggg aaa tac cca 4897  
 Ala Glu Gly Arg Gln Asp Ser Lys Ser Thr Ser Pro Gly Lys Tyr Pro  
 1535 1540 1545 1550

cac ccc ggc ttg gca gat ttt gcc gac aat ctc atc aaa gag agt gac 4945  
 His Pro Gly Leu Ala Asp Phe Ala Asp Asn Leu Ile Lys Glu Ser Asp  
 1555 1560 1565

atc ctg agc gat gaa gat gat gac cac cgt cag act gtg aag cag ggc 4993  
 Ile Leu Ser Asp Glu Asp Asp Asp His Arg Gln Thr Val Lys Gln Gly  
 1570 1575 1580

agc cct act aaa gac atc gaa att cag ttc cag aga ctg agg att tcc 5041  
 Ser Pro Thr Lys Asp Ile Glu Ile Gln Phe Gln Arg Leu Arg Ile Ser  
 1585 1590 1595

gag gac cca gac gtt cac ccc gag gct gag cag cag cct ggc ccg gag 5089  
 Glu Asp Pro Asp Val His Pro Glu Ala Glu Gln Gln Pro Gly Pro Glu  
 1600 1605 1610

tcg ggt gag ggt cag aaa gga gga gag cag ccc aaa ctg gtc cgg ggg 5137  
 Ser Gly Glu Gly Gln Lys Gly Gly Glu Gln Pro Lys Leu Val Arg Gly  
 1615 1620 1625 1630

cac ttc tgc ccc att aaa cga aaa gcc aac agc acc aag agg gac aga 5185  
 His Phe Cys Pro Ile Lys Arg Lys Ala Asn Ser Thr Lys Arg Asp Arg  
 1635 1640 1645

gga act ttg ctc aag gcg cag atc cgt cac cag tcc ctt gac agt cag 5233  
 Gly Thr Leu Leu Lys Ala Gln Ile Arg His Gln Ser Leu Asp Ser Gln  
 1650 1655 1660

tct gaa aat gcc acc atc gac cta aat tct gtt cta gag cga gaa ttc 5281  
 Ser Glu Asn Ala Thr Ile Asp Leu Asn Ser Val Leu Glu Arg Glu Phe  
 1665 1670 1675

agt gtc cag agt tta aca tct gtt gtc agt gag gag tgt ttt tat gaa 5329  
 Ser Val Gln Ser Leu Thr Ser Val Val Ser Glu Glu Cys Phe Tyr Glu  
 1680 1685 1690

4095230-09029030



5380

5437

|       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> | 2   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Met   | Gly | Asn | Ser | Asp | Ser | Gln | Tyr | Thr | Leu | Gln | Gly | Ser | Lys | Asn | His |
| 1     |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser   | Asn | Thr | Ile | Thr | Gly | Ala | Lys | Gln | Ile | Pro | Cys | Ser | Leu | Lys | Ile |
|       |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Arg   | Gly | Val | His | Ala | Lys | Glu | Glu | Lys | Ser | Leu | His | Gly | Trp | Gly | His |
|       |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly   | Ser | Asn | Gly | Ala | Gly | Tyr | Lys | Ser | Arg | Ser | Leu | Ala | Arg | Ser | Cys |
|       | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Leu   | Ser | His | Phe | Lys | Ser | Asn | Gln | Pro | Tyr | Ala | Ser | Arg | Leu | Gly | Gly |
| 65    |     |     |     | 70  |     |     |     |     |     | 75  |     |     |     |     | 80  |
| Pro   | Thr | Cys | Lys | Val | Ser | Arg | Gly | Val | Ala | Tyr | Ser | Thr | His | Arg | Thr |
|       |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Asn   | Ala | Pro | Gly | Lys | Asp | Phe | Gln | Gly | Ile | Ser | Ala | Ala | Phe | Ser | Thr |
|       |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Glu   | Asn | Gly | Phe | His | Ser | Val | Gly | His | Glu | Leu | Ala | Asp | Asn | His | Ile |
|       |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Thr   | Ser | Arg | Asp | Cys | Asn | Gly | His | Leu | Leu | Asn | Cys | Tyr | Gly | Arg | Asn |
|       | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Glu   | Ser | Ile | Ala | Ser | Thr | Pro | Pro | Gly | Glu | Asp | Arg | Lys | Ser | Pro | Arg |
| 145   |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Val   | Leu | Ile | Lys | Thr | Leu | Gly | Lys | Pro | Asp | Gly | Cys | Leu | Arg | Val | Glu |
|       |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Phe   | His | Asn | Gly | Gly | Asn | Pro | Ser | Lys | Val | Pro | Ala | Glu | Asp | Cys | Ser |
|       |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Glu   | Pro | Val | Gln | Leu | Leu | Arg | Tyr | Ser | Pro | Thr | Leu | Ala | Ser | Glu | Thr |
|       |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ser   | Pro | Val | Pro | Glu | Ala | Arg | Arg | Gly | Ser | Ser | Ala | Asp | Ser | Leu | Pro |
|       |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ser   | His | Arg | Pro | Ser | Pro | Thr | Asp | Ser | Arg | Leu | Arg | Ser | Ser | Lys | Gly |
| 225   |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ser   | Ser | Leu | Ser | Ser | Glu | Ser | Ser | Trp | Tyr | Asp | Ser | Pro | Trp | Gly | Asn |
|       |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ala   | Gly | Glu | Leu | Ser | Glu | Ala | Glu | Gly | Ser | Phe | Leu | Ala | Pro | Gly | Met |
|       |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Pro   | Asp | Pro | Ser | Leu | His | Ala | Ser | Phe | Pro | Pro | Gly | Asp | Ala | Lys | Lys |
|       |     |     | 275 |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Pro   | Phe | Asn | Gln | Ser | Ser | Ser | Leu | Ser | Ser | Leu | Arg | Glu | Leu | Tyr | Lys |
|       |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Asp   | Ala | Asn | Leu | Gly | Ser | Leu | Ser | Pro | Ser | Gly | Ile | Arg | Leu | Ser | Asp |
| 305   |     |     |     | 310 |     |     |     |     |     | 315 |     |     |     |     | 320 |
| Glu   | Tyr | Met | Gly | Thr | His | Ala | Ser | Leu | Ser | Asn | Arg | Val | Ser | Phe | Ala |
|       |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Ser   | Asp | Ile | Asp | Val | Pro | Ser | Arg | Val | Ala | His | Gly | Asp | Pro | Ile | Gln |
|       |     |     | 340 |     |     |     |     | 345 |     |     |     |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |
| Asp | Thr | Ala | Lys | Lys | Asp | Ser | Leu | Lys | Ala | Arg | Met | Arg | Arg | Ile | Ser |  |
|     | 370 |     |     |     |     |     | 375 |     |     |     | 380 |     |     |     |     |  |
| Asp | Trp | Thr | Gly | Ser | Leu | Ser | Arg | Lys | Lys | Arg | Lys | Leu | Gln | Glu | Pro |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |  |
| Arg | Ser | Lys | Glu | Gly | Ser | Asp | Tyr | Phe | Asp | Ser | Arg | Ser | Asp | Gly | Leu |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |  |
| Asn | Thr | Asp | Val | Gln | Gly | Ser | Ser | Gln | Ala | Ser | Ala | Phe | Leu | Trp | Ser |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |  |
| Gly | Gly | Ser | Thr | Gln | Ile | Leu | Ser | Gln | Arg | Ser | Glu | Ser | Thr | His | Ala |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |
| Ile | Gly | Ser | Asp | Pro | Leu | Arg | Gln | Asn | Ile | Tyr | Glu | Asn | Phe | Met | Arg |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |
| Glu | Leu | Glu | Met | Ser | Arg | Thr | Asn | Thr | Glu | Asn | Ile | Glu | Thr | Ser | Thr |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |
| Glu | Thr | Ala | Glu | Ser | Ser | Ser | Glu | Ser | Leu | Ser | Ser | Leu | Glu | Gln | Leu |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |  |
| Asp | Leu | Leu | Phe | Glu | Lys | Glu | Gln | Gly | Val | Val | Arg | Arg | Ala | Gly | Trp |  |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |  |
| Leu | Phe | Phe | Lys | Pro | Leu | Val | Thr | Val | Gln | Lys | Glu | Arg | Lys | Leu | Glu |  |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |  |
| Leu | Val | Ala | Arg | Arg | Lys | Trp | Lys | Gln | Tyr | Trp | Val | Thr | Leu | Lys | Gly |  |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |  |
| Cys | Thr | Leu | Leu | Phe | Tyr | Glu | Thr | Tyr | Gly | Lys | Asn | Ser | Met | Asp | Gln |  |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |  |
| Ser | Ser | Ala | Pro | Arg | Cys | Ala | Leu | Phe | Ala | Glu | Asp | Ser | Ile | Val | Gln |  |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |  |
| Ser | Val | Pro | Glu | His | Pro | Lys | Lys | Glu | Asn | Val | Phe | Cys | Leu | Ser | Asn |  |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |  |
| Ser | Phe | Gly | Asp | Val | Tyr | Leu | Phe | Gln | Ala | Thr | Ser | Gln | Thr | Asp | Leu |  |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |  |
| Glu | Asn | Trp | Val | Thr | Ala | Val | His | Ser | Ala | Cys | Ala | Ser | Leu | Phe | Ala |  |
|     | 610 |     |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |  |
| Lys | Lys | His | Gly | Lys | Glu | Asp | Thr | Leu | Arg | Leu | Leu | Lys | Asn | Gln | Thr |  |
| 625 |     |     |     |     | 630 |     |     |     |     | 635 |     |     |     |     | 640 |  |
| Lys | Asn | Leu | Leu | Gln | Lys | Ile | Asp | Met | Asp | Ser | Lys | Met | Lys | Lys | Met |  |
|     |     |     |     | 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |  |
| Ala | Glu | Leu | Gln | Leu | Ser | Val | Val | Ser | Asp | Pro | Lys | Asn | Arg | Lys | Ala |  |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |  |
| Ile | Glu | Asn | Gln | Ile | Gln | Gln | Trp | Glu | Gln | Asn | Leu | Glu | Lys | Phe | His |  |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |  |
| Met | Asp | Leu | Phe | Arg | Met | Arg | Cys | Tyr | Leu | Ala | Ser | Leu | Gln | Gly | Gly |  |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |  |
| Glu | Leu | Pro | Asn | Pro | Lys | Ser | Leu | Leu | Ala | Ala | Ala | Ser | Arg | Pro | Ser |  |
| 705 |     |     |     |     | 710 |     | </  |     |     |     |     |     |     |     |     |  |

|      |      |      |      |      |     |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Gln  | Asp  | Asn  | His  | Gly  | Val | Thr  | Val  | Gly  | Ile  | Lys  | Pro  | Glu  | His  | Arg  | Val  |
|      |      |      | 820  |      |     |      |      | 825  |      |      |      |      | 830  |      |      |
| Glu  | Asp  | Ile  | Leu  | Thr  | Leu | Ala  | Cys  | Lys  | Met  | Arg  | Gln  | Leu  | Glu  | Pro  | Ser  |
|      |      | 835  |      |      |     |      | 840  |      |      |      |      | 845  |      |      |      |
| His  | Tyr  | Gly  | Leu  | Gln  | Leu | Arg  | Lys  | Leu  | Val  | Asp  | Asp  | Asn  | Val  | Glu  | Tyr  |
|      | 850  |      |      |      |     | 855  |      |      |      | 860  |      |      |      |      |      |
| Cys  | Ile  | Pro  | Ala  | Pro  | Tyr | Glu  | Tyr  | Met  | Gln  | Gln  | Gln  | Val  | Tyr  | Asp  | Glu  |
| 865  |      |      |      |      | 870 |      |      |      | 875  |      |      |      |      |      | 880  |
| Ile  | Glu  | Val  | Phe  | Pro  | Leu | Asn  | Val  | Tyr  | Asp  | Val  | Gln  | Leu  | Thr  | Lys  | Thr  |
|      |      |      | 885  |      |     |      |      |      | 890  |      |      |      |      | 895  |      |
| Gly  | Ser  | Val  | Cys  | Asp  | Phe | Gly  | Phe  | Ala  | Val  | Thr  | Ala  | Gln  | Val  | Asp  | Glu  |
|      |      |      | 900  |      |     |      |      | 905  |      |      |      |      | 910  |      |      |
| Arg  | Gln  | His  | Leu  | Ser  | Arg | Ile  | Phe  | Ile  | Ser  | Asp  | Val  | Leu  | Pro  | Asp  | Gly  |
|      |      | 915  |      |      |     |      | 920  |      |      |      |      | 925  |      |      |      |
| Leu  | Ala  | Tyr  | Gly  | Glu  | Gly | Leu  | Arg  | Lys  | Gly  | Asn  | Glu  | Ile  | Met  | Thr  | Leu  |
|      | 930  |      |      |      |     | 935  |      |      |      | 940  |      |      |      |      |      |
| Asn  | Gly  | Glu  | Ala  | Val  | Ser | Asp  | Leu  | Asp  | Leu  | Lys  | Gln  | Met  | Glu  | Ala  | Leu  |
| 945  |      |      |      | 950  |     |      |      |      |      | 955  |      |      |      |      | 960  |
| Phe  | Ser  | Glu  | Lys  | Ser  | Val | Gly  | Leu  | Thr  | Leu  | Ile  | Ala  | Arg  | Pro  | Pro  | Asp  |
|      |      |      | 965  |      |     |      |      |      | 970  |      |      |      |      | 975  |      |
| Thr  | Lys  | Ala  | Thr  | Leu  | Cys | Thr  | Ser  | Trp  | Ser  | Asp  | Ser  | Asp  | Leu  | Phe  | Ser  |
|      |      | 980  |      |      |     |      |      | 985  |      |      |      |      | 990  |      |      |
| Arg  | Asp  | Gln  | Lys  | Ser  | Leu | Leu  | Pro  | Pro  | Pro  | Asn  | Gln  | Ser  | Gln  | Leu  | Leu  |
|      |      | 995  |      |      |     |      | 1000 |      |      |      |      | 1005 |      |      |      |
| Glu  | Glu  | Phe  | Leu  | Asp  | Asn | Phe  | Lys  | Lys  | Asn  | Thr  | Ala  | Asn  | Asp  | Phe  | Ser  |
|      | 1010 |      |      |      |     | 1015 |      |      |      | 1020 |      |      |      |      |      |
| Asn  | Val  | Pro  | Asp  | Ile  | Thr | Thr  | Gly  | Leu  | Lys  | Arg  | Ser  | Gln  | Thr  | Asp  | Gly  |
| 1025 |      |      |      | 1030 |     |      |      |      |      | 1035 |      |      |      |      | 1040 |
| Thr  | Leu  | Asp  | Gln  | Val  | Ser | His  | Arg  | Glu  | Lys  | Met  | Glu  | Gln  | Thr  | Phe  | Arg  |
|      |      |      | 1045 |      |     |      |      |      | 1050 |      |      |      |      | 1055 |      |
| Ser  | Ala  | Glu  | Gln  | Ile  | Thr | Ala  | Leu  | Cys  | Arg  | Ser  | Phe  | Asn  | Asp  | Ser  | Gln  |
|      |      | 1060 |      |      |     |      |      | 1065 |      |      |      | 1070 |      |      |      |
| Ala  | Asn  | Gly  | Met  | Glu  | Gly | Pro  | Arg  | Glu  | Asn  | Gln  | Asp  | Pro  | Pro  | Pro  | Arg  |
|      | 1075 |      |      |      |     |      | 1080 |      |      |      |      | 1085 |      |      |      |
| Pro  | Leu  | Ala  | Arg  | His  | Leu | Ser  | Asp  | Ala  | Asp  | Arg  | Leu  | Arg  | Lys  | Val  | Ile  |
|      | 1090 |      |      |      |     | 1095 |      |      |      |      | 1100 |      |      |      |      |
| Gln  | Glu  | Leu  | Val  | Asp  | Thr | Glu  | Lys  | Ser  | Tyr  | Val  | Lys  | Asp  | Leu  | Ser  | Cys  |
| 1105 |      |      |      | 1110 |     |      |      |      |      | 1115 |      |      |      |      | 1120 |
| Leu  | Phe  | Glu  | Leu  | Tyr  | Leu | Glu  | Pro  | Leu  | Gln  | Asn  | Glu  | Thr  | Phe  | Leu  | Thr  |
|      |      |      | 1125 |      |     |      |      |      | 1130 |      |      |      |      | 1135 |      |
| Gln  | Asp  | Glu  | Met  | Glu  | Ser | Leu  | Phe  | Gly  | Ser  | Leu  | Pro  | Glu  | Met  | Leu  | Glu  |
|      |      | 1140 |      |      |     |      |      | 1145 |      |      |      |      | 1150 |      |      |
| Phe  | Gln  | Lys  | Val  | Phe  | Leu | Glu  | Thr  | Leu  | Glu  | Asp  | Gly  | Ile  | Ser  | Ala  | Ser  |
|      | 1155 |      |      |      |     |      | 1160 |      |      |      |      | 11   |      |      |      |

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 Tyr Glu Asp Tyr Gly Thr Val Phe Asp Gln Leu Val Ala Glu Gln Ser  
                                  1300                      1305                      1310  
 Gly Thr Glu Lys Glu Val Thr Glu Leu Ser Met Gly Glu Leu Leu Met  
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 His Ser Thr Val Ser Trp Leu Asn Pro Phe Leu Ser Leu Gly Lys Ala  
                                  1330                      1335                      1340  
 Arg Lys Asp Leu Glu Leu Thr Val Phe Val Phe Lys Arg Ala Val Ile  
 1345                      1350                      1355                      1360  
 Leu Val Tyr Lys Glu Asn Cys Lys Leu Lys Lys Lys Leu Pro Ser Asn  
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 Ser Arg Pro Ala His Asn Ser Thr Asp Leu Asp Pro Phe Lys Phe Arg  
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 Trp Leu Ile Pro Ile Ser Ala Leu Gln Val Arg Leu Gly Asn Pro Ala  
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 Ile Glu Gly Arg Pro Glu Thr Ile Phe Gln Leu Cys Cys Ser Asp Ser  
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 Glu Ser Lys Thr Asn Ile Val Lys Val Ile Arg Ser Ile Leu Arg Glu  
                                  1445                      1450                      1455  
 Asn Phe Arg Arg His Ile Lys Cys Glu Leu Pro Leu Glu Lys Thr Cys  
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                                  1525                      1530                      1535  
 Gly Arg Gln Asp Ser Lys Ser Thr Ser Pro Gly Lys Tyr Pro His Pro  
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 Gly Leu Ala Asp Phe Ala Asp Asn Leu Ile Lys Glu Ser Asp Ile Leu  
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 Thr Lys Asp Ile Glu Ile Gln Phe Gln Arg Leu Arg Ile Ser Glu Asp  
 1585                      1590                      1595                      1600  
 Pro Asp Val His Pro Glu Ala Glu Gln Gln Pro Gly Pro Glu Ser Gly  
                                  1605                      1610                      1615  
 Glu Gly Gln Lys Gly Gly Glu Gln Pro Lys Leu Val Arg Gly His Phe  
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 Cys Pro Ile Lys Arg Lys Ala Asn Ser Thr Lys Arg Asp Arg Gly Thr  
                                  1635                      1640                      1645  
 Leu Leu Lys Ala Gln Ile Arg His Gln Ser Leu Asp Ser Gln Ser Glu  
                                  1650                      1655                      1660  
 Asn Ala Thr Ile Asp Leu Asn Ser Val Leu Glu Arg Glu Phe Ser Val  
 1665                      1670                      1675                      1680  
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 Ser His Gly Lys Ser  
                                  1700

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| actggtgcta  | agcaaattcc  | ttgtccctg   | aaaatacgtg  | gcgttcacgc  | aaaagaggaa  | 120  |
| aagtcattgc  | atggatgggg  | tcacgggagc  | aacggagcag  | gttacaagtc  | caggtccctg  | 180  |
| gcccgaaact  | gcctttctca  | ctttaagagt  | aaccagcctt  | acgcacgag   | actcgggtggc | 240  |
| cccacatgca  | aggtctccag  | aggtgttgcc  | tactccacgc  | acaggacaaa  | tgccccaggg  | 300  |
| aaggatttcc  | agggcatcag  | tgctgctttc  | tcaactgaga  | atggcttcca  | ttctgttggc  | 360  |
| cacgagctgg  | cagataacca  | catcacctcc  | agagactgca  | acggacacct  | tctcaactgc  | 420  |
| tacgggagga  | atgagagcat  | tgccctccacc | ccaccgggcg  | aagaccgcaa  | gagccccga   | 480  |
| gtgctcatca  | aaacgctggg  | gaagccggat  | gggtgtttaa  | gggtcgagtt  | ccacaatggt  | 540  |
| ggcaacccca  | gcaaagtgcc  | tgacagaggac | tgacgtgagc  | cgggtgcagct | gctgaggtac  | 600  |
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| agctccctga  | gttctgagtc  | atctgggtac  | gactccctt   | ggggcaatgc  | tgagagctg   | 780  |
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| cgacggatca  | gtgactggac  | gggaagcctc  | tcaaggaaga  | aaaggaaact  | ccaggagccg  | 1200 |
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| caggccacca  | gccagacaga  | tctagaaaac  | tggtgctactg | ctgtacactc  | tgcttgtgca  | 1860 |
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&lt;212&gt; PRT

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&lt;220&gt;

&lt;223&gt; Consensus sequence

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Lys Lys Lys Pro Lys Gly Ser Ile Pro Leu Ser Gly Cys Gln Val Glu
                35                40                45
Lys Pro Asp Lys Asn Cys Phe Glu Ile Arg Thr Asp Arg Thr Leu Leu
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Gln Ser Ala Ile Arg

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85

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 35 40 45  
 Ile Leu Ser Val Asn Gly Gln Asp Val Glu Asn Met Ser His Glu Arg  
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1052200.030300

Ser Ser Lys Pro Val Leu Thr Pro Asp Asp Ile Glu Thr Ile Phe Ser  
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 Leu Glu Ala Arg Ile Ser Ser Ser Gln Phe Glu Asp Leu Asp Glu Lys  
 65 70 75 80  
 Lys Ile Glu Pro Ser Ala Pro Arg Leu Gly Asp Leu Phe Leu Lys Leu  
 85 90 95  
 Lys Glu Pro Phe Leu Gln Val Tyr Gly Glu Tyr Cys Ser Asn Lys Pro  
 100 105 110  
 Tyr Ala Gln Glu Leu Leu Glu Lys Leu Arg Gln Ala Ala Ser Asn Pro  
 115 120 125  
 Gln Phe Ala Glu Phe Leu Asp Glu Val Glu Ala Ser Ser Asn Thr Gly  
 130 135 140  
 Ala Lys Asp Asp Ala Val Lys Leu Thr Leu Gln Ser Leu Leu Leu Lys  
 145 150 155 160  
 Pro Val Gln Arg Ile Leu Arg Tyr Pro Leu Leu Leu Lys Glu Leu Leu  
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 Asp Lys Asn Cys Phe Glu Ile Arg Thr Asp Arg Thr Leu Leu Leu Gln  
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